National Aeronautics and Space Administration

Gulf of Mexico Initiative

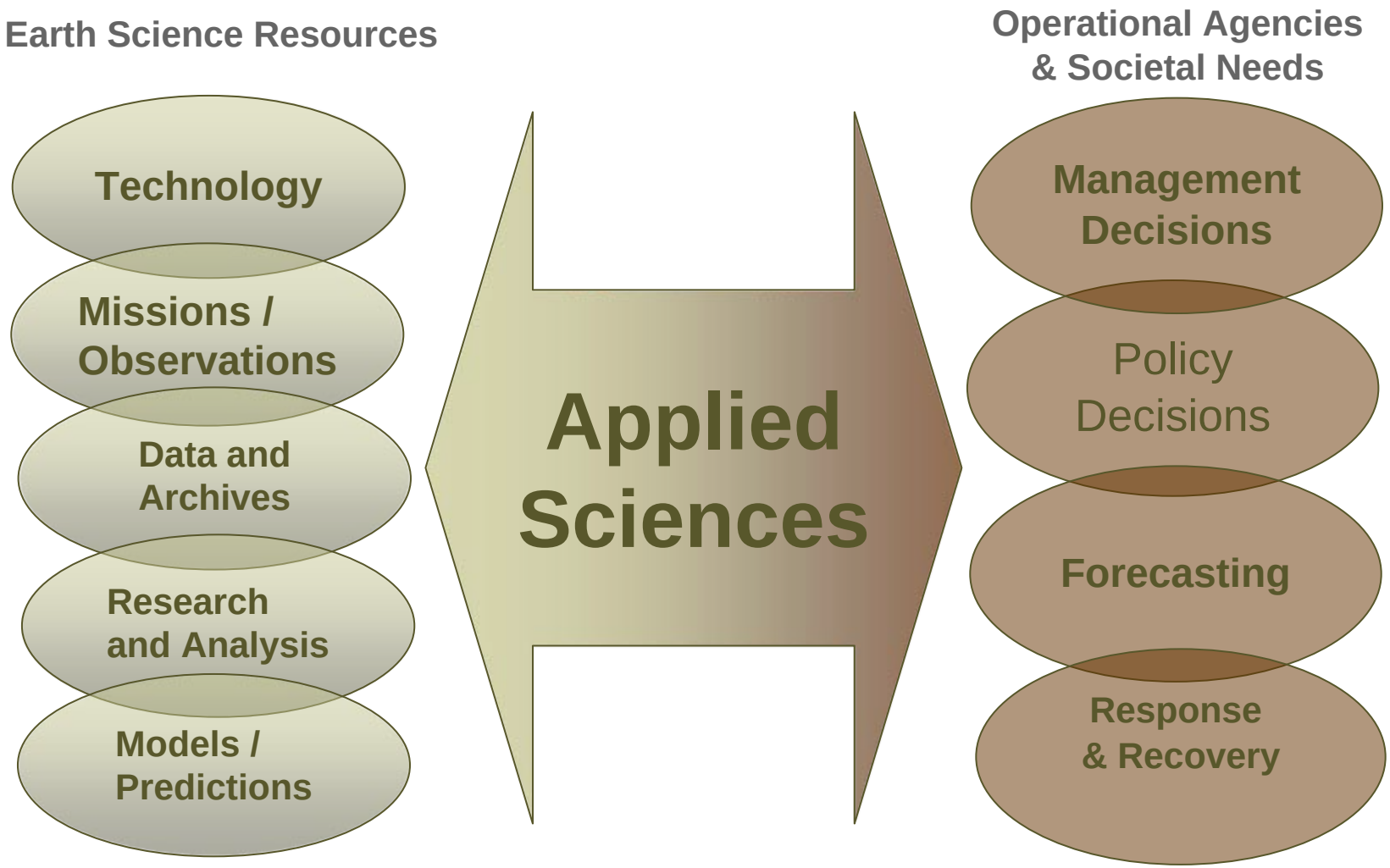
NASA Stennis Space Center

May 12, 2008

www.coastal.ssc.nasa.gov

Gulf of Mexico Initiative

The Applied Sciences program works to cross the gap between research and applications. Within the limits of NASA's mission, we attempt to demonstrate how the results of NASA research can benefit society.



Applied Sciences Program Constraints

- NASA is a research agency
- We cannot guarantee continuity of observations
- We cannot provide data products indefinitely
- We can demonstrate improvement to operational decision support systems; however, ultimately, these capabilities must be transferred to operational agencies

NASA Satellite Utility: 2007 Core Mission Review

	CoMRP Ranking	NOAA	USGS	Navy	Other DOD
Aqua	**Very High**	Very High	Very High	Very High	Very High
MODIS	*Very High*	*Very High*	*Very High*	*Very High*	*Very High*
AIRS	*Very High*	*Very High*	*NA*	*Very High*	*Very High*
AMSR-E	*Very High*	*High*	*NA*	*Very High*	*Very High*
CERES	*NA*	*NA*	*NA*	*NA*	*NA*
Terra	**Very High**	Very High	Very High	Very High	Very High
MODIS	*Very High*	*High*	*Very High*	*Very High*	*Very High*
ASTER	*High*	*NA*	*High*	*NA*	*High*
CERES	*NA*	*NA*	*NA*	*NA*	*NA*
MISR	*NA*	*NA*	*NA*	*NA*	*NA*
MOPITT	*NA*	*NA*	*NA*	*NA*	*NA*
TRMM	**Very High**	High	Some Utility	Very High	Very High
QuikSCAT	**Very High**	Very High	NA	Very High	Very High
Jason	**Very High**	Very High	NA	Very High	High
CloudSat	**High**	Some Utility	NA	High	Very High
SORCE	**High**	High	NA	NA	High
GRACE	**High**	NA	NA	NA	High
ICESat	**Some Utility**	NA	Some Utility	NA	High
EO-1	**Some Utility**	NA	NA	NA	Very High
ACRIMSAT	**NA**	NA	NA	NA	NA

Gulf of Mexico Initiative

- NASA Stennis Space Center (SSC) has been instructed to
  - Focus the efforts of its applied science program on the issues facing the Gulf of Mexico and its coastal regions as identified by the Gulf of Mexico Alliance (GOMA)
  - Interact and collaborate with the coastal management community and other entities to identify areas that can benefit from the utilization of NASA Earth science
  - Develop a 3-5 year strategic plan that will be used to guide the deployment of NASA resources in the Gulf of Mexico

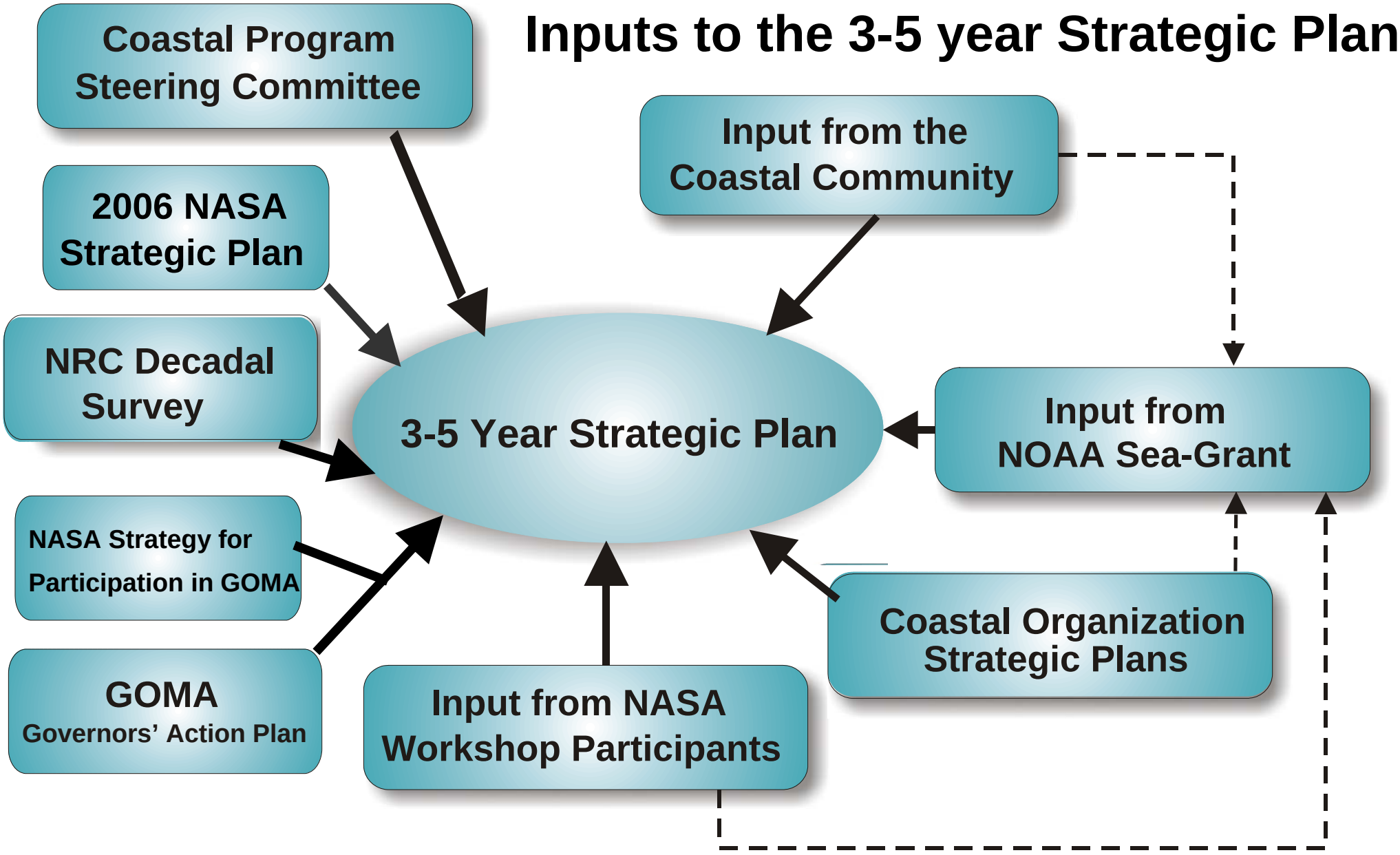
Guiding Principles

Vision: Enhance local, state and federal decision making capabilities through the infusion of NASA Earth science research pertaining to the Gulf of Mexico and its coastal regions.

Mission: Demonstrate the utility of NASA Earth science data, tools and techniques by addressing the issues facing the Gulf of Mexico and its coastal regions.

Motto: Applied research enables better decisions

Inputs to the 3-5 year Strategic Plan



Strategic Planning Objectives

- Determine NASA potential Gulf of Mexico application priority areas
  - Based on stakeholder input
  - Linked to the GOMA Governors' Action Plan
    - » Focus on national and regional efforts and resources
    - » Supports GOMA's six priority issues

- Identify opportunities for organizations to collaboratively address needs, reduce overlap of effort, and demonstrate the utility of NASA Earth science for decision making and resource management
- Obtain community feedback throughout Strategic Plan development

Method Used to Identify Priority Topics

- Participation on GOMA priority issue teams
  - Water quality (Callie Hall)
  - Resiliency (Dr. Jean Ellis)
  - Wetland and coastal restoration (Dr. Jean Ellis)
  - Environmental education (Dr. Joseph Grant)
  - Characterization of Gulf habitats (Craig Peterson)
  - Reductions in nutrient inputs (Bruce Spiering)

- Utilized Sea Grant Research Planning/Prioritization
  - Review of 117 Strategic Plans
  - Web-based Survey (1,582 responses, 571 comments)
  - Five Workshops (**278** attendees)
    - » Focused on Ocean Research Priorities Plan six societal themes
    - » Identify and prioritize specific research topics

Method Used to Identify Priority Topics

- Developed Matrix of 410 topics from Sea Grant Research Planning Workshops
  - Mapped to GOMA priorities (new priorities being developed)
  - Identified Topics having potential for NASA capabilities
  - Sorted/ranked by number of votes
  - Identified geographic locations
- Collected input from other conferences
- Collected inputs from GOMA planning efforts
- Identified 4 Major Priority Areas and Groupings

Priority Topics

Regional Sediment Management and Wetland Restoration

GOMA Priority Area: Wetland and Coastal Conservation and Restoration

- Assess the relationship between regional sediment management and coastal water quality
- Assess the impact of changing sediment loads on coastal habitats
- Assess the effects of river diversion on regional sediment management, wetland restoration, existing recreational use, water quality, and habitat function
- Monitor wetland restoration efforts

Climate Change

GOMA Priority Area: Coastal Community Resilience

- Monitor and understand climate induced changes in ecosystems and habitats (land-use and land-cover change)
- Assess the impact of changing hydrologic conditions
- Relate climate change to the pattern and/or distribution of freshwater inflows and ecosystems
- Model and monitor the impacts of storm surge
- Assess the Gulf of Mexico carbon cycle trends and potential impacts to current Gulf ecosystem functions
- Assess the potentially changing oceanic circulation patterns

Priority Topics

Sea Level Change

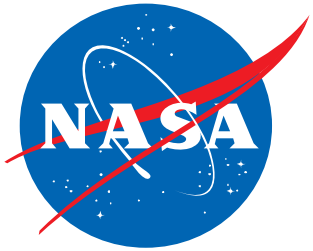
GOMA Priority Area: Coastal Community Resilience

- Monitor and understand the effect of sea level change on ecosystems
- Monitor coastline and barrier island change using long-term, low/medium resolution imagery
- Model and monitor salt water intrusion

Water Quality and Nutrient Monitoring for Assessment of Ecosystem Health

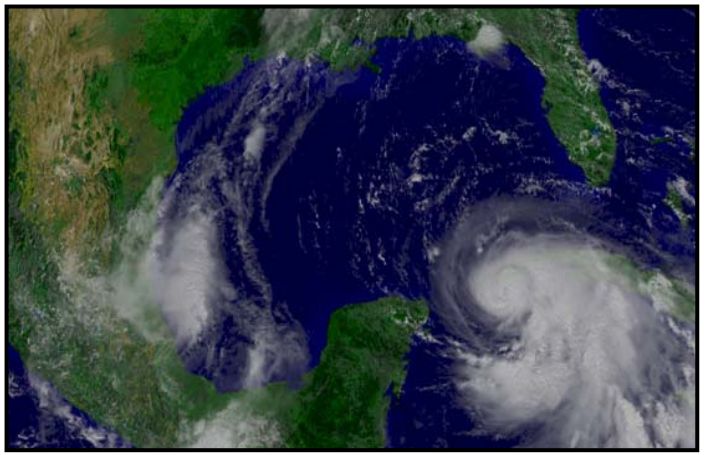
GOMA Priority Areas:
Water Quality for Healthy Beaches and Shellfish Beds, and Reducing Nutrient Inputs to Coastal Ecosystems

- Monitor and assess the impacts of nutrients and freshwater fluxes on ecosystem health and function
- Monitor and model non-point source pollution
- Assess freshwater requirements for healthy marsh ecosystems
- Monitor and forecast harmful algal blooms
- Model, assess and predict hypoxia
- Monitor the changing volumes of major Gulf of Mexico rivers
- Assess the impact of urbanization on water quality, nutrients and ecosystem health


NASA

Ocean Research Priorities Plan Societal Themes

- Stewardship of Natural and Cultural Ocean Resources
- Increasing Resilience to Natural Hazards
- Enabling Marine Operations
- The Ocean's Role in Climate
- Improving Ecosystem Health
- Enhancing Human Health



Images: NOAA

NASA Earth Science Applications: Operational Guidelines

- Select projects through open, competitive solicitations.
- Use existing infrastructure for data archiving, distribution and product generation.
- Define projects, and identify decision support tools, through ***partnerships with organizations with operational responsibilities.***

ROSES – 2008 Solicitation

- *ROSES Sections (Google NASA NSPIRES)*
- *A.18 Decision Support through Earth Science Research Results*
- *A19 Feasibility Studies*

- General Schedule:

Proposals Due	*August 08*
Review Period	*Sept-November 08*
Award Announcements	*~ November 30*
Projects Begin	*January, 2009*

Gulf of Mexico Initiative

DEVELOP fosters human capital development to extend NASA science research to local communities. Students demonstrate to community leaders prototype applications of NASA science measurements and predictions addressing local policy issues. The activities are student led, with advisors and mentors from NASA and other partner organizations.

23 Projects currently

175 Students in FY07 from high school through graduate school from 29 states:

Ames 20
Stennis (includes Southern/LA) 17
Mobile/AL 12
Langley 101
Goddard 13
Savannah/GA 12